<u>Amendments to the Claims:</u>

This listing of claims will replace all prior versions, and listings, of claims in the application:

<u>Listing of Claims:</u>

1.   (original) An autostereoscopic optical apparatus for displaying a stereoscopic virtual image to a first viewer and to a second viewer, wherein the stereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the apparatus comprising:

(a) a left image generation system for forming a curved left intermediate image;

(b) a left projection system comprising a left ball lens segment, wherein the pupil of said left ball lens segment is substantially concentric with said curved left intermediate image, said left ball lens segment forming a real image of said curved left intermediate image;

(c) a first beamsplitter disposed to direct said curved left intermediate image toward a focal surface of a first curved mirror, said first curved mirror forming a virtual image of said curved left intermediate image thereby, and said first curved mirror disposed to form:

(i) through said first beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through a second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(d) a right image generation system for forming a curved right intermediate image;

(e) a right projection system comprising a right ball lens segment, wherein the pupil of said right ball lens segment is substantially concentric with said curved right intermediate image, said right ball lens segment forming a real image of said curved right intermediate image;

(f) a third beamsplitter disposed to direct said curved right intermediate image toward a focal surface of a second curved mirror, said second

curved mirror forming a virtual image of said curved right intermediate image thereby, and said second curved mirror disposed to form:

(i) through said third beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer.

2.   (original) An autostereoscopic optical apparatus according to claim 1 wherein said left ball lens segment comprises an hemispheric lens and a reflective surface.

3.   (original) An autostereoscopic optical apparatus according to claim 1 wherein said left image generation system comprises a liquid crystal display component.

4.   (original) An autostereoscopic optical apparatus according to claim 1 wherein said right ball lens segment comprises an hemispheric lens and a reflective surface.

5.   (original) An autostereoscopic optical apparatus according to claim 1 wherein said right image generation system comprises a liquid crystal display component.

6.   (withdrawn) An autostereoscopic optical apparatus for displaying a stereoscopic virtual image to a first viewer and to a second viewer, wherein the stereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the apparatus comprising:

(a) a left image generation system for forming a curved left intermediate image;

(b) a left projection system comprising a left ball lens segment, wherein the pupil of said left ball lens segment is substantially

concentric with said curved left intermediate image, said left ball lens segment forming a real image of said curved left intermediate image;

(c) a first beamsplitter disposed to direct said curved left intermediate image toward a second beamsplitter said second beamsplitter then directing said curved left intermediate image toward a focal surface of a first curved mirror, said first curved mirror forming a virtual image of said curved left intermediate image, and said first curved mirror disposed to form:

(i) through said second and first beamsplitters, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(d) a right image generation system for forming a curved right intermediate image;

(e) a right projection system comprising a right ball lens segment, wherein the pupil of said right ball lens segment is substantially concentric with said curved right intermediate image, said right ball lens segment forming a real image of said curved right intermediate image;

(f) said first beamsplitter disposed to direct said curved right intermediate image toward said second beamsplitter, said second beamsplitter then directing said curved right intermediate image toward said focal surface of said first curved mirror, said first curved mirror forming a virtual image of said curved right intermediate image, and said first curved mirror disposed to form:

(i) through said first and second beamsplitters, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer.

7.   (withdrawn) An autostereoscopic optical apparatus according to claim 6 further comprising a folding mirror disposed in the optical path of the second viewer.

8.   (withdrawn) An autostereoscopic optical apparatus according to claim 6 wherein said left ball lens segment comprises an hemispheric lens and a reflective surface.

9.   (withdrawn) An autostereoscopic optical apparatus according to claim 6 wherein said left image generation system comprises a liquid crystal display component.

10.   (withdrawn) An autostereoscopic optical apparatus according to claim 6 wherein said right ball lens segment comprises an hemispheric lens and a reflective surface.

11.   (withdrawn) An autostereoscopic optical apparatus according to claim 6 wherein said right image generation system comprises a liquid crystal display component.

12.   (withdrawn) An autostereoscopic optical apparatus for displaying a stereoscopic virtual image to a first viewer and to a second viewer, wherein the stereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the apparatus comprising:

(a) a left image generation system for forming a curved left intermediate image;

(b) a left projection system comprising a left ball lens segment, wherein the pupil of said left ball lens segment is substantially concentric with said curved left intermediate image, said left ball lens segment forming a real image of said curved left intermediate image;

(c) a first beamsplitter disposed to direct said curved left intermediate image toward a second beamsplitter, said second beamsplitter then directing said curved left intermediate image toward a focal surface of a curved

mirror for forming a virtual image of said curved left intermediate image thereby, and said curved mirror disposed to form:

(i) through said first and second beamsplitters, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through said second beamsplitter and a third beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(d) a right image generation system for forming a curved right intermediate image;

(e) a right projection system comprising a right ball lens segment, wherein the pupil of said right ball lens segment is substantially concentric with said curved right intermediate image, said right ball lens segment forming a real image of said curved right intermediate image;

(f) said third beamsplitter disposed to direct said curved right intermediate image toward the focal surface of said curved mirror for forming a virtual image of said curved right intermediate image thereby, and said curved mirror disposed to form

(i) through said third beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer; and

(ii) through said second beamsplitter and said first beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer.

13. (withdrawn) An autostereoscopic optical apparatus for displaying a stereoscopic virtual image to a first viewer and to a second viewer, wherein the stereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the apparatus comprising:

(a) a left image generation system for forming a curved left intermediate image;

(b) a left projection system comprising a left ball lens segment, wherein the pupil of said left ball lens segment is substantially concentric with said curved left intermediate image, said left ball lens segment forming a real image of said curved left intermediate image;

(c) a first beamsplitter disposed to direct said curved left intermediate image through a second beamsplitter and toward a focal surface of a curved mirror, said curved mirror forming a virtual image of said curved left intermediate image thereby, and said curved mirror disposed to form:

(i) through said first and second beamsplitters, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(d) a right image generation system for forming a curved right intermediate image;

(e) a right projection system comprising a right ball lens segment, wherein the pupil of said right ball lens segment is substantially concentric with said curved right intermediate image, said right ball lens segment forming a real image of said curved right intermediate image;

(f) said first beamsplitter disposed to direct said curved right intermediate image toward the focal surface of said curved mirror, said curved mirror forming a virtual image of said curved right intermediate image thereby, and said curved mirror disposed to form:

(i) through said second beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer; and

(ii) through said second beamsplitter and said first beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer.

14.   (original) A method for displaying an autostereoscopic virtual image to a first viewer and to a second viewer, wherein the

autostereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the method comprising:

(a) forming a curved left intermediate image;

(b) projecting a real image of said curved left intermediate image through a left ball lens segment toward a focal surface of a first curved mirror, said first curved mirror forming a virtual image of said curved left intermediate image, and said first curved mirror disposed to form:

(i) through a first beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through a second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(c) forming a curved right intermediate image;

(d) projecting a real image of said curved right intermediate image through a right ball lens segment toward a focal surface of a second curved mirror, said second curved mirror forming a virtual image of said curved right intermediate image, and said second curved mirror disposed to form:

(i) through a third beamsplitter, a real image of a the pupil of said right ball lens segment at the right viewing pupil of the second viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer.

15. (original) A method for displaying an autostereoscopic virtual image according to claim 14 wherein the step of forming said curved left intermediate image comprises the step of controlling an area spatial light modulator.

16. (cancelled)

17. (withdrawn) A method for displaying an autostereoscopic virtual image to a first viewer and to a second viewer, wherein the

autostereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the method comprising:

(a) forming a curved left intermediate image;

(b) projecting a real image of said curved left intermediate image through a left ball lens segment toward a focal surface of a first curved mirror, said first curved mirror forming a virtual image of said curved left intermediate image and said first curved mirror disposed to form:

(i) through a first and a second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(c) forming a curved right intermediate image;

(d) projecting a real image of said curved right intermediate image through a right ball lens segment toward a focal surface of a second curved mirror, said second curved mirror forming a virtual image of said curved right intermediate image and said second curved mirror disposed to form:

(i) through said first and second beamsplitters, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer.

18.   (withdrawn) A method for displaying an autostereoscopic virtual image to a first viewer and to a second viewer, wherein the autostereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the method comprising:

(a) forming a curved left intermediate image;

(b) projecting a real image of said curved left intermediate image through a left ball lens segment toward a focal surface of a curved mirror, said curved mirror forming a virtual image of said curved left intermediate image and said curved mirror disposed to form:

(i) through a first and a second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through said second beamsplitter and a third beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(c) forming a curved right intermediate image;

(d) projecting a real image of said curved right intermediate image through a right ball lens segment toward said focal surface of said curved mirror, said curved mirror forming a virtual image of said curved right intermediate image and said curved mirror disposed to form:

(i) through said third beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer; and

(ii) through said second beamsplitter and said first beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer.

19.   (withdrawn) A method for displaying an autostereoscopic virtual image to a first viewer and to a second viewer, wherein the autostereoscopic virtual image is imaged to each viewer at a left viewing pupil and a right viewing pupil, the method comprising:

(a) forming a curved left intermediate image;

(b) projecting a real image of said curved left intermediate image through a left ball lens segment toward a focal surface of a curved mirror, said curved mirror forming a virtual image of said curved left intermediate image and said curved mirror disposed to form:

(i) through a first and a second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the first viewer; and

(ii) through said second beamsplitter, a real image of the pupil of said left ball lens segment at the left viewing pupil of the second viewer;

(c) forming a curved right intermediate image;

(d) projecting a real image of said curved right intermediate image through a right ball lens segment toward said focal surface of said curved mirror, said curved mirror forming a virtual image of said curved right intermediate image and said curved mirror disposed to form:

(i) through said second beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the second viewer; and

(ii) through said second beamsplitter and said first beamsplitter, a real image of the pupil of said right ball lens segment at the right viewing pupil of the first viewer.